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The USENIX Association Newsletter

Volume 15, Number 2 **March/April 1990**

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The closing date for submissions for the next issue of *;login:* is April 27, 1990.

USENIX **THE PROFESSIONAL AND TECHNICAL UNIX® ASSOCIATION**

NOTICE

;login: (ISSN 1044-6397) is published bi-monthly by the USENIX Association.

The USENIX Association is a not-for-profit organization of those interested in UNIX[†] and UNIX-like systems. It is dedicated to fostering and communicating the development of research and technological information and ideas pertaining to advanced computing systems, to the monitoring and encouragement of continuing innovation in advanced computing environments, and to the provision of a forum where technical issues are aired and critical thought exercised so that its members can remain current and vital.

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Contributions Solicited

Members of the UNIX community are encouraged to contribute articles to *;login:*. Contributions may be sent electronically to *login@usenix.org* or through the U.S. mail to the Association office. The USENIX Association reserves the right to edit submitted material.

;login: is produced on UNIX systems using *troff* and a variation of the –me macros. Contributions should be in *n/troff* input format, using any macro package.

UUNET Subscriptions

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Acknowledgments

The Association uses a Sun[‡] 3/180S running SunOS for support of office and membership functions, preparation of *;login:*, and other Association activities. Connected to the Sun is a QMS Lasergrafix[*] 800 Printer System donated by Quality Micro Systems of Mobile, Alabama. It is used for general printing and draft production of *;login:* and *Computing Systems* with *ditroff* software provided by mt Xinu. The membership and mailing lists are maintained using Sybase.[#]

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USENIX Online Library/Index

What Is It:

The USENIX online index is an electronically available list of papers published by the USENIX Association and related groups. It contains title, author, and related information about papers published in USENIX and UNIX-related conference and workshop proceedings, newsletters, journals, and the like.

The index is freely available, and is kept as a simple ASCII file, in refer/bib format, sorted by author. In some cases, electronically readable versions of full papers or abstracts are also available. If a paper is available online, this is indicated in its index entry.

How to Get the Index:

The index is available online from UUNET, either via a mail server or anonymous ftp. The index is about 200K, and available only in entirety. To get it via electronic mail:

```
$ echo send bibliography | \
  mail uunet!library
```

A (non-human) server will automatically break the index up into mailable chunks (if necessary), and return it to the sender of the mail.

Or, the index can be retrieved via anonymous ftp to *uunet.uu.net*:

```
ftp> get library/bibliography my_local_file
```

To get a help file:

```
$ echo help | mail uunet!library
```

To pick up the date the index was last changed:

```
$ echo send date | mail uunet!library
```

For those unable to reach UUNET, the index is also available in hardcopy format from the Association office.

Online Papers and Abstracts:

We are actively soliciting the donation of papers and abstracts to include in the library. If you have had a paper published in any of the publications listed below, and you wish to donate the paper, you must provide us with an electronic version and give us permission to distribute it. You or your employer may retain the copyright if you wish.

If you wish to donate an abstract, we are prepared to type it in for you – all we need is your permission.

Publications Indexed:

Currently we have indexed all available issues of the following:

USENIX:
- Conference proceedings
- Workshop proceedings
- *Computing Systems*
- *;login:*

European UNIX User Group:
- Conference proceedings
- Newsletters

Software Tools User Group:
- Conference proceedings

Australian UNIX User Group:
- Newsletters

UNIX Review periodical

We are in the process of incorporating Japanese UNIX Society publications to the index. Other sources (AFUU, GUUG, NZUSUGI, etc.) are being continually evaluated and will be included as deemed suitable.

More Information:

For additional information about the online index and library, and/or instructions for donating abstracts or papers, contact:

usenix!index (index@usenix.org)

Or contact the Association's executive office.

USENIX Supporting Members

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mt Xinu

1990 Board of Directors Election Information

The following 1990 USENIX Board of Directors' Candidates' Statements along with ballots were sent to all paid-up members as of March 7, 1990, on or about March 12. Members will have until April 6 to return their ballots to the Association office. The results of the election will be announced at the Anaheim Conference and in the next issue of *;login:*. Newly elected directors will take office immediately following the Anaheim conference in June.

Candidate for President

Stephen C. Johnson

Biographical Information

Ph.D. in Mathematics, Columbia University, 1968. Joined Bell Labs, 1967, where I worked in computer music, psychometrics, computer algebra, computer theory, VLSI design. Wrote *yacc, lint,* and the *Portable C Compiler.* Co-author (with Dennis Ritchie) of the first UNIX port. Joined Stardent Computer as Vice President in 1986. Joined NCUBE in 1990. Member of the USENIX board, 1984-1990, Treasurer, 1986-1990. Taught tutorials at USENIX and EUUG.

Position Statement

For USENIX to succeed, we need to have both a vision of the future and an attention to the details of the present. The details are largely handled by the staff; the board's chief role is making sure that the staff is empowered with resources and direction to continue our conferences and publications, and that the often confusing financial picture doesn't get out of hand. My years of experience as a manager and as USENIX Treasurer have given me a detailed knowledge of the details and a good working relationship with the staff.

My vision of USENIX is as the meeting ground of the technical and the practical. UNIX has become the universal base for operating systems; we can no longer use UNIX as a simple way to distinguish ourselves from ACM or IEEE. USENIX is already moving beyond UNIX, and I propose to accelerate this, supporting, for example, Mach and Chorus rather than POSIX and yet another BSD UNIX, C++ rather than ANSI C, technical innovation rather than standards wars. I also want to see USENIX encourage a broader group of attendees–men, women, students, neophytes, gurus, kernel hackers, and systems administrators, but all with a technical, practical orientation. We have a lot to gain from diversity, and should be flexible enough to accommodate many different peoples' needs.

In my career, I have combined management and timely product delivery with innovation and active technical involvement (including papers in USENIX and ACM conferences and the Journal). Join me so USENIX can go forward with this vision.

Candidate for President

Marshall Kirk McKusick

Biographical Information

Kirk McKusick got his undergraduate degree in Electrical Engineering from Cornell University. His graduate work was done at the University of California at Berkeley, where he received Masters degrees in Computer Science and Business Administration, and a Computer Science Ph.D. in the area of programming languages. While at Berkeley he implemented the 4.2BSD fast file system and was involved in implementing the Berkeley Pascal system. He currently is the Research Computer Scientist at the Berkeley Computer Systems Research Group, continuing the development of future versions of Berkeley UNIX. He has been a member of the USENIX board since 1986. He is a member of the editorial board of UNIX Review Magazine and a member of ACM, IEEE, and USENIX.

Position Statement

The goal of the USENIX Association as stated in its charter is the "exchange and communication of research and technological information and ideas pertaining to UNIX and UNIX-related computer systems." The strength of the organization has been its emphasis on presenting the leading edge of UNIX research and technology. USENIX should continue to have conferences and workshops with refereed papers and proceedings available at or before the conference. I am committed to the new member services that we have started in the past two years. These include an inexpensive subscription service to receive all the USENIX conference and workshop proceedings published during the year, an online database of past proceedings along with the ability to order back copies of the indexed proceedings, and the expansion of half to full years membership checkoff at the summer conference. I favor eliminating the licensing restrictions on the tutorials that we offer at our conferences and am pleased that USENIX has been able to eliminate the licensing restriction on my own BSD tutorial.

The emergence of the commercial UNIX marketplace has necessitated large marketing-oriented conferences such as those run by UniForum. Although many members of USENIX need or want to attend these conferences, USENIX should not try to host marketing-oriented conferences. An appropriate compromise is to work with UniForum to schedule separate conferences that are held at the same time and in the same city so that members can attend both conferences in a single trip.

During the past term, I championed the By-Laws change to limit tenure on the board; enthusiasm and new ideas require new faces on the board. I would like to see further changes in the election procedures so that the voters have more choice than approving the slate of officers picked by the nominating committee. For the first time in the history of the organization, you have a choice for President of the board; I can ask for your vote, not your approval. Educational, research, and advanced commercial development communities have a major role in the development and promulgation of UNIX. As a researcher at an academic institution, my viewpoint will perform a key role in representing these interests.

Candidate for Vice President

Michael D. O'Dell

Biographical Information

Mike O'Dell received both his B.S. (1976) and M.S (1980) degrees in Computer Science from the University of Oklahoma. He has been an avid UNIX proponent since writing a PL/I program to print Fifth Edition manual pages from a tape of nroff(1) output. He later went on to install and run the University's first college-wide timesharing system. Upon escaping university, he joined the Lawrence Berkeley Laboratory where he survived the ARPAnet's Great TCP Conversion. Currently, Mike is living the life of a Consultant after having served most recently as the Chief Computer Scientist for an ill-fated start-up company working on a GaAs supercomputer. He remains active in the areas of networks, operating systems, electronic music, and of course, UNIX.

His recent USENIX activities include:

- USENIX Board of Directors, Member-at-Large
- Editor-in-Chief of *Computing Systems*, the USENIX quarterly journal
- Board of Directors, UUNET Communications Corporation

Position Statement

I am standing for election to the Board of Directors as Vice-President in order to continue serving the Association in general, and the Board in particular. Our most recent Vice-president, Deborah Scherrer, set a very high mark for service in this office and I intend to honor the tradition.

The USENIX Association was founded to provide services to the technical and professional UNIX community, and I remain deeply committed to this mission. My Board tenure has been engaging, at times amusing, and always rewarding. My role as Editor-in-Chief of the journal is one of the most gratifying jobs I have ever had, and the new book publishing initiative just approved by the Board is even more exciting. As a Director of UUNET Communications Corporation, I provide ongoing communication between the Association and its inventive offspring. These jobs are all extremely rewarding and I appreciate the opportunity to serve the community in these ways.

USENIX continues to experiment with services and activities: the Professional Development Seminars, the new Concurrent Sessions at the January conference, and the new book initiative are all examples. I believe the greatest challenge remains understanding and refining what makes us different from other groups. As UNIX continues to grow in popularity, there is a very real risk of the Association changing from a group of innovative futurists into the protectors of the status quo, or of becoming indistinguishable from the ACM or the IEEE. These alternatives are utterly unacceptable.

On the other hand, we have a long, deeply-cherished tradition of being the conduit for technical information exchange within the UNIX community, and we cannot forsake that role lest we disown our birthright. Therefore, the dual challenge is to remain a beacon of technical information for the newcomers and new converts to UNIX, while at the same time continue to move forward as we must. Thus far, the Association has avoided success disasters – i.e. failures resulting from too much success. But as UNIX becomes more mainstream (who would have believed that would ever be a serious concern?) the risks increase and the balancing act becomes even more crucial.

The Association continues to have a wonderfully eclectic membership (a short perusal of the BOF Board at any conference is ample proof) and I feel a deep obligation to not only look after the affairs of the Association, but to nurture our reputation as being THE group focusing on the hard technical issues of UNIX and Beyond, while maintaining our tradition of congeniality and conviviality.

A final thought – Inventing the future is a FUN job. Come to USENIX and share it!

Candidate for Secretary

Rob Kolstad

Biographical Information

B.A.Sc. (Computer Science) Southern Methodist University, 1974.

M.S.E.E. (Electrical Engineering) Notre Dame University, 1976.

Ph.D. (Computer Science) Univ. Illinois at U/C, 1982.

Software Manager, Sun Microsystems. Co-Program Chairman 1985 Winter USENIX Conference. Chairman 1988 Winter USENIX Conference. Co-Chairperson USENIX 1987 Systems Administrator Conference. Frequent speaker at USENIX conferences. Member of USENIX board 1986-1990. Fourteen years of UNIX experience.

Position Statement

The success of Users' Groups in general depends heavily on their correct discernment of their role in their particular community. USENIX's success and strength has been achieved in two ways. One way USENIX succeeds is by enabling and enhancing communication among all levels of UNIX users: through conferences, *;login:*, the Journal, Usenet mapping, UUNET, manual distribution, tutorials, and workshops. USENIX must continue to engender projects like these and to monitor and improve their quality.

But potentially more important even than communication is innovation. The USENIX board continually strives to attain and experiment with new ideas and projects. Conference chairmen continually try new ideas: talks that run on a schedule, proceedings with work barely two months old, works-in-progress sessions, and alternative tracks. Few disagree that UUNET and the new workshop formats are innovative. This innovation continually revitalizes the organization and its membership. Now that UNIX is older, the distribution of members' experience with it is more diverse. We must serve innovation to all our members.

I believe USENIX should continue to foster the positive communications and innovation that are so visible to the community. I have worked over the last four years to encourage the revival of small workshops as vehicles for focused technical gatherings, acquired two 75 megabyte distribution tapes of public-domain sources, upgraded the presentation of conference proceedings, enabled more students to attend conferences, and encouraged identification and funding of relevant projects. If re-elected, I will continue to work to support projects such as these and new innovative ones which contribute services or products to enhance not only communications but also technology within the UNIX community. The April 1990 planning meeting will be the next milestone on the road to new projects. I will be there with new proposals. If reelected, I also intend to explore the budget in ever more detail to understand how USENIX can balance the costs and services to its users.

Candidate for Treasurer

Sharon Murrel

Biographical Information

Sharon Murrel has been a member of technical staff at AT&T Bell Laboratories for 12 years. After completing her undergraduate degree at New York University and all but her doctoral thesis at the State University of New York at StonyBrook, she joined the Labs. There she developed a real-time satellite system named Parasite with Ted Kowalski and wrote a series of experiments and processes using that system, after which she did a thesis on computer conferencing and did receive her PhD from StonyBrook. She then wrote monk, a database-driven formatting interface to troff. It is designed to simplify the end user task, however, its main focus has been the development of typographical databases and the high-level language in which they are written. She is now working with the interactive visual editors for tbl and troff, new troff preprocessors for layout and placement as well as glossaries. All of these new tools are being used to produce the AT&T Technical Journal in-house. She is now experimenting with new layout primitives for troff and with releasing some of her functioning tools. Both are difficult tasks.

Position Statement

I have now been a member of the USENIX board for two years. It takes much of the first year to wet ones ears; so by now it is really fun and productive. In a fit of enthusiasm, I am standing for the post of Treasurer. I admire the successful development of the Association from a small, casual group of techies to a large, structured, and yet still technical organization. The organization remains as strong as the technical content of its meetings, tutorials, and publications. With the introduction of more technical workshops and the recent advent of the journal, these are constantly improving. The board is now launching an effort to publish technical monographs, which is magnificent technically but may not be attractive to most publishers because of its limited distribution.

USENIX must maintain its position as the forum for the technical innovations proposed and implemented by its increasingly diverse membership. USENIX can and should be innovative, reaching to include technical exchange about new languages and new operating systems. I advocate more technical workshops, more effort to foster communication among the diverse interest groups and more funding for novel member projects. I have worked with Eric Allman, Lori Grob, and the Executive Director, Ellie Young, to organize the recent set of concurrent sessions. Attended by between 100 and 265 people, these talks provided some theory, history, and practical nitty gritty about regular expressions, Make, networks, support, Nawk, and Perl. This first series can only be described as a success in terms of both quality and attendance. USENIX hopes to continue this talk series and to extend these sessions to provide small forums for the informal exchange of technical information.

Educational, research,
and advanced commercial development communities play a major role in the development and acceptance of UNIX. It is important that all of these communities be represented on the board. As a member of the research community at a small and backward, but long-lived UNIX facility, my viewpoint will bring a breath of fresh air in representing alternate interests. Moreover, the board needs an AT&T representative to heckle during discussions of the UNIX Operating System's future.

Candidate for Director

Rick Adams

Biographical Information

BS in Computer Science, 1979, MS, 1980, Purdue University

Systems Analyst, Purdue University, 1981-82

Member Technical Staff, RLG/CCI, 1982-83

Chief Systems Programmer, Center for Seismic Studies, 1983-89

Founder, President, Technical Director, UUNET Communications Services, 1989-present

Editorial Advisory Board, *Computing Systems*, 1990

Co-Author *!%@:: A Directory of Electronic Mail Addressing & Networks*

Maintained Usenet B news software, 1982-88

Maintained BSD UUCP software, 1985-present

Current interests: communications, networking, operating systems

Invited speaker: INRIA, Paris, France; IX International Conference of the Chilean Computer Science Society, Santiago, Chile; and others

Position Statement

I have attended a majority of all USENIX board meetings since October, 1986. While my participation at those meetings was presenting reports and observing, I learned a great deal about how USENIX functions as an organization. This, coupled with my three years' experience as both a UUNET board member and the person responsible for UUNET's day-to-day operations greatly enhances my ability to serve on the USENIX Board.

USENIX continues to enjoy financial success. While traditionally USENIX has depended heavily on volunteer efforts, it's time for the Association to "adopt" successful volunteer efforts like the FaceSaver and Terminal Room and consider them integral parts of the Association's services. This adoption would ensure the continued availability of these services and would allow a continued high level of service without the uncertainty that sometimes is present with volunteer efforts.

This would free volunteers from the operational nuisances of providing these proven valuable services and allow them to devote their efforts to other innovative and potentially successful efforts.

Candidate for Director

Peter Collinson

Biographical Information

In 1973, after graduating from the University of Essex, UK with a B.A. and Ph.D. in Computer Science, I took up a post of Lecturer in Computer Science at the University of Kent at Canterbury. In 1976, I found myself running UNIX V6 on a small PDP11/40. In 1980, Kent had acquired a VAX 11/780 and I was responsible for writing the code supporting a Cambridge Ring Local Area Network for UNIX 32V and later 4.[0123]BSD. This predated full commercial availability of Ethernet and the invention of sockets. I stopped teaching in 1983 and headed a support group that was actively involved with the development of UNIX on the Kent campus. A large part of the effort here has been the establishing of the UK Usenet backbone. I left the university in 1989 to form my own consultancy firm. The company is dedicated to earning enough money to allow me to pursue my own interests: doing whatever, whenever, wherever.

I have always been interested in user groups. I was an early member of the UK group, and became its Chairman for a year in 1978. After resigning, I stayed on the committee and was a founding member of the EUUG. Between 1982 and 1988, I served the EUUG in various capacities from ranging from Newsletter Editor to Secretary.

My USENIX activities include:

- Invited speaker for the Washington 1987 'Great USENIX Snowflake' conference. Presented the 'Science fiction' paper.
- EUUG representative to Dallas Winter 1988 'The nearest sidewalk is 20 miles away' conference.
- Presented paper at San Francisco Summer 1988 'People go home by 3pm Friday, so let's show the others a neat video' conference. Ran and judged contest.
- Attended the Washington Winter 1990 'Let's all go and bait the Board Candidates' conference.
- Editorial board member of *Computing Systems* since the start of publication.

Position Statement

I am grateful for the opportunity to stand for election to the USENIX board since it allows me to continue to contribute to the worldwide community of computer users. The community has been fostered by UNIX and also by the growth of the network, in which I have played a part.

In a world where corporate interests dominate the future of UNIX, USENIX has a vital independent role. The Association is adapting well to the differing needs of old and new members; careful, rather than radical, evolution seems to be the key to success.

Why should a foreigner run for USENIX? USENIX is not just a North American organization – approximately 15% of the membership are not US or Canadian citizens. I have been a USENIX member since 1977. Originally I was the institutional representative for the University of Kent. I am now an individual member.

Won't a foreigner be costly to transport to board meetings? No, it can cost less to fly from London into an international US airport than it does to fly from one US coast to another.

What can a foreigner do for USENIX? I believe I can bring a fresh and informed perspective to the administration of the Association. My EUUG experience has been very relevant at the board meetings I have attended, Dallas 1988 and Washington 1990. I enjoy being involved with running User Groups – and I am good at it.

Candidate for Director

Dr. Daniel E. Geer, Jr.

Biographical Information

S.B., 1972, Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, Mass.; Sc.D., 1988, Biostatistics, Epidemiology, and Artificial Intelligence, Harvard University, School of Public Health, Cambridge, Mass.

Member: Association for Computing Machinery (1975), Massachusetts Public Health Association (1978), American Public Health Association (1980), American Association for Artificial Intelligence (1980), Biometrics Society (1981), Society for Industrial & Applied Mathematics (1981), American Statistical Association (1981), Society for Medical Decision Making (1983), USENIX Association (1985), (Session Chair 2/88; Tutorial Instructor 6/88, 2/89, 7/89; Program Committee 10/89-1/90; Session Chair 1/90), Society for Artificial Intelligence and Statistics (1988).

For over four years, I have led the Systems Development group at MIT's Project Athena in the design, implementation, and propagation of the world's largest centrally managed, vendor neutral, scalable distributed computing environment. The design requirements of that effort led directly to a UNIX-based solution, and have allowed me to demonstrate my leadership abilities as we have moved a large university from departmental timesharing to a network services model of computation. Our software, such as the X Window System and the Kerberos network authentication system, are now ubiquitous in the UNIX community. The rest of my 20 years of experience is in the area of medical, clinical, and statistical computing, areas where there exist significant opportunities for the expansion of the UNIX environment, and where I have particular expertise. My chief technical interests are computing in the large, wide area systems administration, computer assisted cooperative work, and (software tools for) multimedia workstations.

Position Statement

My interest in the Board of Directors is natural: USENIX is the single organization with both the longstanding commitment to open systems and the technical throw-weight to make the right things happen. My various past USENIX activities as an author/presenter, Program Committee member, Session Chair, Tutorial Speaker, and BOF convener illustrate my involvement with UNIX issues, and my role as the principal technical speaker to the roughly 2500 visitors Project Athena entertains annually indicates my commitment to expanding and improving the UNIX universe. I believe my experience and vision can serve the USENIX organization well as UNIX grows in the 1990s. I would very much appreciate your support, and pledge the kind of activism that takes the long range view.

Candidate for Director

Ed Gould

Biographical Information

For the last seven years, I have been working at MT XINU, a Berkeley, California, supplier of BSD- and Mach-based operating system software. MT XINU is, among other things, employee owned and dedicated to employee management. Prior to co-founding MT XINU in 1983, I was a member of the technical staff of the Computer Center of the University of California at Berkeley, where I did software development for a home-grown variant of the operating system for a CDC 6400 and, starting in 1976, software development and systems administration for a collection of UNIX systems. After leaving U.C. in 1982, I managed UNIX systems and did software development for two R&D groups at National Semiconductor Corporation.

Position Statement

I have been attending UNIX Users' conferences since 1977, before the current USENIX Association was formally incorporated. Over that time, I have seen the organization grow from an ad-hoc collection of (mostly) kernel hackers getting together to discuss which bugs they had each tripped over and fixed, to a moderately large, professionally-run organization serving a diverse community.

As the community of UNIX Users has grown and diversified, so has the membership of USENIX. The membership has an ever-growing set of needs that the organization might choose to address. One of the primary challenges facing USENIX over the coming years is to balance maintaining the level of technical content in its conferences and publications against recognizing that more and more of the membership consists of people new to the UNIX system.

I would like to see the organization continue to grow—not necessarily in size, but as a provider of services to its membership. We have seen interesting changes over the last few years, including the inauguration of *Computing Systems* and the increase in the number of workshops and the attendance at the workshops. The experiment of having a track of what I like to call "nuts and bolts" sessions running in parallel with the traditional research-oriented track was a great success. More such sessions at future conferences look to be a wonderful way to include more of the membership into the main stream of the conferences.

In general, I see USENIX as an organization whose purpose consists largely of two related items. First is education. It's clear that one of the major purposes for attending a USENIX conference is to take the tutorials. The tutorial program has been well run and the tutorials themselves have been of high quality. We need to maintain at least the current level of tutorial offerings, and increase those offerings whenever the combination of interest, qualified speakers, and space are available.

Second, the Association is a vehicle for disseminating information about happenings in the UNIX community, and for fostering communication among users. In recent years, there has been a strong emphasis on research-oriented presentations at conferences. While research topics are important and of continuing interest to much of the membership, there is a large—and growing—segment of the USENIX audience that can be better served by presentations with more day-to-day value. Also, with the increasing penetration of network connectivity, due in part to the success of the USENIX-sponsored UUNET experiment, some of the communications functions that the Association has served in the past are being well-served by other means. USENIX needs to continue to explore new ways to facilitate communication among the UNIX community.

Another avenue that I think would be good for USENIX to pursue is that of encouraging creativity and new ideas within the community. To this end, I would like to encourage presentations about other operating systems—both commercial systems (successes *and* failures, current and historical) and research projects—at USENIX conferences. To some degree, the Association has already ventured into this area, particularly in the workshop it recently co-sponsored with ACM and SERC on Distributed and Multiprocessor Systems. I would like to see continued emphasis on variety in the programming of the conferences.

Candidate for Director

Daniel V. Klein

Biographical Information

I am currently employed by the Software Engineering Institute in Pittsburgh. I hold a Masters of Science in Applied Mathematics from Carnegie-Mellon University, and as an employee of the University, served for 4 years as Chairman of both the Staff Council and University Grievance Review Board. I have been attending USENIX conferences for 10 years, and have been working with the association since 1984. I was technical program chair for the Winter '90 Conference.

Position Statement

My goals as a director of the USENIX Association are simple, and can be listed in two short items.

1. USENIX needs to foster quality in publications and research. We as an association need to keep the level of technical excellence of the conferences and of the work that we fund at a high level. The work we present at conferences needs to be both interesting and worthwhile. UNIX and the members of USENIX are all changing, and we as an organization need to grow with them.

2. USENIX needs to continue to attract new people. I do *not* mean that we need to grow just for the sake of growing. What we do need to do is continue to keep the Association, its conferences, and workshops enticing for both our existing membership and for potential new members. As we as a community grow, it essential for our personal development to continue to meet with new people, to see new work, to generate new ideas, and to stay abreast of the new developments in our field.

When I chaired the D.C. conference, I set out to satisfy these two goals. We tried to attract new people – the alternate sessions were a first pass at broadening the appeal of USENIX; we maintained a high level of technical content, although much of this credit goes to the authors themselves; and finally, we provided an entertaining and stimulating environment in which to acquire the information available at the conference. I have a very strong committment to the organization, and want to do even more. Your vote will enable me to do so.

Candidate for Director

Evi Nemeth

Biographical Information

Evi Nemeth earned her undergraduate degree in Mathematics from Penn State University and Ph.D. degree, also in Mathematics, from the University of Waterloo in Ontario, Canada. She joined the Computer Science faculty at the University of Colorado in 1981 and has helped expand the UNIX facility there from a single PDP 11/70 to its present configuration of over 100 machines which serve the research and instructional needs of thousands of students. Evi is currently on one semester leave from CU to teach at Dartmouth College in Hanover, New Hampshire.

Evi has been involved with UNIX since Version 6 days, though often more as a political ally than as a developer. Evi instigated the use of UNIX in the SUNY system in New York state and later at the University of Colorado. She is a co-author (with two of her students) of *The UNIX System Administration Handbook* (Prentice Hall, 1989), has produced the Proceedings for almost all recent USENIX Conferences, and has taught several USENIX tutorials.

Position Statement

Universities and students have always had a special symbiosis with UNIX and USENIX. Even today as the system makes its way into the commercial world, universities — Berkeley, Utah, CMU, MIT and others — continue to push the technical state of the art and contribute new ideas and utility.

One of my goals is to see the Association continue to maintain strong ties to universities and to students. I also hope to influence the Association to continue the innovation which enables it to serve all its members: not only wizards and gurus but also newcomers — the future lifeblood of the organization. To this end, I will support programs like the alternate track of non-research talks that was so well received at the recent conference in Washington, D.C.

Candidate for Director

Sonya D. Neufer

Biographical Information

Sonya Neufer received her Bachelor's degree in Computer Science from the University of California, San Diego. While there, she worked for the Computer Science department as an assistant to the systems administrator. She also assisted in the development and instruction of a new undergraduate course which taught the basics of UNIX to computer-naive undergraduates. She went on to work for Datapoint where she introduced UNIX into their proprietary systems environment. This grew into a position as lead technical advisor for Datapoint's introduction of UNIX into its product line. From there she was transferred to Datapoint's Canadian Development office to assist in the implementation of UNIX-compatible networking software for Datapoint's proprietary RMS Operating System. She is now working as a systems analyst for Canstar, a company that does software design and development for fiber-optic networks. Sonya organized and ran the Terminal room at the San Diego, Baltimore, and Washington USENIX Conferences.

Position Statement

The evolution of the USENIX Association over the last ten years has been outstanding. The attendance at technical conferences is growing as UNIX catches on in ever more diverse environments. As these environments grow, the Association must grow with them, making sure the technical content at our conferences maintains its high standards. We are getting better formal papers, now we need to concentrate our efforts on the new informal (concurrent) sessions to interest more of our members while retaining serious technical content.

I believe that as we approach 1992, USENIX should encourage closer participation from similar international organizations. Considering the number of common interests that are shared between EUUG, AUUG, and USENIX there are many avenues of cooperation that need to be explored. As well, with the new freedoms in the eastern bloc, groups there are showing a growing UNIX membership which should be welcomed as well.

Student participation in the USENIX Association is growing, but more work is necessary to encourage students wishing to learn about the technical venues available. Student grants have helped university students in attending conferences, but more needs to be done to promote active student participation.

I have enjoyed working with the USENIX Association organizing and running the Terminal room at the last three conferences. I hope that I will be able to expand my participation into other areas as a member of the Board of Directors.

Candidate for Director

Barry Shein

Biographical Information

President, Software Tool & Die

I have been an active member of USENIX for several years, most recently as co-chair of the USENIX Software Management Workshop. I have been involved with UNIX for over 13 years, going back to the early V6 days when I used UNIX for real-time programming in medical research at Harvard.

In 1983 I became the first member of the Distributed Systems Group at Boston University and was charged with supporting UNIX and creating a campus-wide network. During that time I was also a graduate student and lecturer in their computer science department. I founded and I am currently president of Software Tool & Die, purveyors to the trade.

Recently I created The Online Book Initiative, a public-spirited project committed to providing freely redistributable online books and other texts. I am technical editor for *Sun/Expert* magazine, a frequent contributor to the ConneXions internetworking journal and have worked on and created software which is in common use in our community (xman, Franz Lisp, Macsyma, the cypress network etc.). I have published many technical articles relating to UNIX, including a recent paper at this past summer USENIX.

Moreover, I know what I am getting into (somewhat); I have spent the past two years on the board of directors of the Sun Users Group and have served as treasurer and secretary for that organization. I am not a stranger to the very pragmatic responsibilities of running a user group.

Position Statement

In today's rapidly changing world many of us are concerned with finding a continuing role for USENIX. UNIX was once a maverick operating system whose primary use seemed to be annoying the status quo. Everyone owned the sources (full source only cost $60 in those halcyon days) and much of the UNIX community made fundamental modifications to the system itself.

USENIX's role in all this was providing a meeting place where those maverick kernel gurus exchanged ideas. Today UNIX has become mainstream and is even threatening to become the status quo. Today a much smaller percentage of people who use UNIX own the sources, let alone have any interest in modifying their systems as radically as we did.

But technology continues to advance at a breathtaking pace and fundamental issues of how to adapt UNIX to that changing technology remain. We have seen the growth of other UNIX user groups with missions to cater to commercial and new users. I don't think USENIX's role has changed much in all this clamor, nor should it.

I see USENIX's purpose as twofold: First, to provide the means for members of the UNIX community to communicate with each other and, second, to be a place where we can get together and influence the future of UNIX.

Concern for the future of UNIX is what makes USENIX unique among the many user groups. It is the organization you come to when you want to find out what might be happening in the next several years or want to sound out a few new ideas of your own. This is a critical role and I intend to see USENIX continue to be vital as an organization which provides innovative channels of communication for those who shape the future of UNIX.

Candidate for Director

Dave Taylor

Biographical Information

Currently President of Intuitive Systems, a consulting firm specializing in user interface design, software marketing strategies and internationalization, Mr. Taylor started in the computer field with a degree in Computer Science from the University of California at San Diego in 1984. During that time, he was an employee of Logicon T&TSD in San Diego. Following that, he began as a technical staff member at Hewlett-Packard Colorado Networks Operation in Fort Collins, Colorado in 1984. Following a year and a half of PC networking, and on the strength of his concurrent software development in the UNIX environment, Mr. Taylor accepted a position as a research scientist at HP Laboratories in Palo Alto, California. While at HP Labs he released the Elm Mail System to the UNIX public, as well as work on remote mail aliases, a sendmail verification suite, and similar. In early 1988 he moved into the HP University Grants Program as Technical Project Leader, and helped steer the group to such important research projects as Mach, Andrew, and Sprite. In late 1988 he resigned from Hewlett-Packard to form Intuitive Systems, and has since consulted with Hewlett-Packard, Apple Computer, Sun Microsystems, the Whole Earth 'Lectronic Link, Merit Software, Artecon, and similar.

In addition to his work with computer programming and marketing, Mr. Taylor has published well over 100 articles in trade journals, and has played a key role in the publication of two books. Currently he is on the editorial staff of "The Sun Observer," "The HP Chronicle," "HP/Apollo Workstation," and "Computer Language," as well as being UNIX columnist for "Computer Currents," a free regional newspaper.

USENIX related experience includes founding the Tutorial Evaluation Committee and being the only non-USENIX board member on the committee, as well as having been on the program committee of a USENIX Technical Conference in 1987.

Position Statement

As a professional journalist, it is clear to me that the "mission" of the USENIX Association is one of communication, or information dissemination. This is a two-way street, and if we consider much of the success of the Association, I believe we'll consistently find that the highest rated activities are those that disseminate key UNIX related information to the members. For example, consider the dramatic growth of the specialized topic symposia; when I became active in the USENIX Association almost seven years ago, the only events I can recall being sponsored were the two technical conferences each year. Now, through focusing on the value of smaller, more narrow topic meetings, there are over a half-dozen symposia each year, all well attended, and all offering information – and personal contacts – not easily available anywhere else.

To me, then, the key challenge that the Association has to face is how to continue to offer the invaluable information to the members in the face of the dramatically evolving UNIX marketplace, as well as with the encroaching competition of UniForum and other vendor specific user groups. (The best way to deal with this particular challenge is to work with the other groups, and as a member of UniForum, the Sun Users Group, and the HP INTEREX Users Group, I am also well positioned to aid in inter-group communication too.)

Additionally, as a Member at Large, I believe that my role is best described as an information funnel, not only to help members understand what is going on with the board of directors, but, much more importantly, to aid the board members in understanding what the views and ideas of the members are. With that in mind, I think it's vitally important for a Member at Large to be a current participant on Usenet and accessible via electronic mail, since these are clearly the most popular vehicles for communication in the technical UNIX community.

Finally, I'll wrap up by simply stating that while it's important that USENIX retain the technical orientation that it started with, and that we hew out a niche for ourselves in the expanding UNIX marketplace, it's perhaps just as important that we have some fun in the process! I can't offer you a chicken in every pot or two cars in every garage, but I can promise that we'll continue to grow and learn more about UNIX every year and have an enjoyable time doing it!

Candidate for Director

Alix Meredith Vasilatos

Biographical Information

A.B. (Economics) Vassar College, 1979; Ph.D. program (Marxian Economics) University of Massachusetts at Amherst, 1979-82.

UNIX Distributed Services and Systems Administration person since 1981, at Harvard, BBN, GTE Labs, MIT Project Athena, and OSF. Many papers and talks on using UNIX, systems administration, and distributed services.

USENIX activities:

- Attendee, all but one conference since Boston 1982, plus some workshops.
- Co-chair, Large Installation Systems Administration Workshop, 1987.
- Chair, Large Installation Systems Administration Workshop II, 1988.
- Informal Program Chair, Baltimore 1989 Summer Conference.
- Chair, Large Installation Systems Administration Workshop II, 1989.
- Program Committee, Washington D.C. 1990 Winter Conference.

Position Statement

I may be an atypical person, but in a typically technoid way, I am happy when the UNIX community is comfortably and creatively computing and cogitating along. I am trying hard to fix it so that everyone who wants to help sustain the kind of USENIX we like and want can do so (by putting in straightforward procedures that make it easy to "jump in" with contributions of ideas, time, special talents, and comradeliness).

The key is information exchange, facilitated by USENIX on paper, USENIX on the networks, USENIX at conferences: folks communicating technical ideas everywhere, every way. USENIX can publish works that will inform the brainstorming that everyone building a new facility or a new service goes through. USENIX can help support public access systems with sufficient connectivity that we can experiment with more nontraditional (noncorporate, nonacademic, nondefense) participation in electronic mail, Usenet news, access to free software, free text, library indices and other databases, multi-media projects, and programming.

We of USENIX have been helping make things happen all along and it has been A Good Thing. Having helped out with USENIX workshops, conferences, committees, and miscellany for a few years, I'd like to help even more, in a more integrated way, to do what we have to do to make sure that our community grows – as it must – coherently, creatively, and collectively. Me, I'm wicked psyched.

Call for Papers: UNIX Security Workshop

Marriott Hotel, Portland, OR, August 27-28, 1990

The Second UNIX Security Workshop is to be held in Portland, Oregon, on Monday and Tuesday, August 27 and 28, 1990. Matt Bishop will again be chairing this workshop. It will bring together researchers in computer security dealing with UNIX and system administrators trying to use UNIX in environments where protection and security are of vital importance. It is intended to provide an environment where researchers can discuss their latest results, where researchers and practitioners can discuss the applicability of those results to practical problems, and where system administrators can share their unique solutions and techniques for dealing with problems. The topics covered by this workshop include both theoretical topics and everyday problems. We expect each participant to present unique attributes of his/her environment and/or research and contribute a short (five minute) discussion (and paper) detailing some result or solution from their environment or work.

Some topics to be considered include:

modeling the UNIX operating system theoretically
password security (password file integrity, enforcing choice of a safe password, spotting and handling crackers)
network security (problems arising from logins over an unprotected Ethernet, containing a break-in to one machine in a networked environment)
security in a distributed system or environment
file system security (auditing packages, security in an NFS environment)
computer worms, viruses, and other phenomena
new designs to obtain C-level (or better) certification
making existing UNIX systems more secure, and locating and fixing UNIX security problems
any other problem or contribution that participants make.

Workshop Format

This gathering will follow a "workshop" format rather than a "paper presentation" format. Please submit a one or two page summary describing a problem and, if you have one, a solution, or if not, a possible approach or approaches which looked promising but failed (or which you have not yet tried). Also, be sure to include with your submission a set of five (or so) topics that you'd like to hear about. It is possible that some participants will not present their papers at this workshop.

The workshop chairman will collate the papers to schedule sessions which have appropriate audiences. It is anticipated that some sessions will include all participants though others may require breaking into smaller groups. Send your submissions to the address below by **May 22, 1990.**

For further information, contact:

Matt Bishop
Dept. of Mathematics and Computer Science
Bradley Hall
Dartmouth College
Hanover, NH 03755

(603) 646-3267
decvax!dartvax!Matt.Bishop
Matt.Bishop@dartmouth.edu

Call for Papers: Mach Workshop

Radisson Hotel, Burlington, VT, October 4-5, 1990

The use of Mach in what has traditionally been the UNIX community is growing as DARPA and OSF increase their Mach-related activities and more vendors are supporting Mach on a variety of platforms. Because Mach itself is changing rapidly and there hasn't been any convenient mechanism for communication among developers, the USENIX Association is pleased to sponsor its first Mach workshop, in which researchers, vendors, and users can share results of Mach-related development work and status reports on work-in-progress.

The workshop will be oriented towards those who have actually worked with Mach or have done Mach-based applications development, and will not be tutorial in nature. The program will consist largely of refereed papers and panels. Abstracts of 350-700 words should be sent to the program chair at the address below (those submitting hardcopy abstracts should send five copies). The deadline for submissions is **June 22, 1990**. All submissions will be acknowledged. Authors will be notified by July 20, 1990, and full papers will be required by August 27, 1990.

For further information about the workshop, contact the program chair:

Melinda Shore
mt Xinu
2560 Ninth St., Suite 312
Berkeley, CA 94710

(415) 644-0146
shore@mtxinu.com

Program Committee:

Alan Langerman, Encore Computer Corporation
Douglas Orr, Carnegie-Mellon University
Homayoon Tajalli, Trusted Information Sys.
Avadis Tevanian, NeXT, Inc.

Call for Papers: IEEE Reliable Distributed Systems Workshop

Huntsville, AL, October 11-12, 1990

With the sponsorship of the technical committee on Distributed Processing of the IEEE Computer Society and in cooperation with the USENIX Association, a workshop on Experimental Distributed Systems will be held on October 11-12, 1990 in Huntsville, Alabama in conjunction with the Ninth IEEE Symposium on Reliable Distributed Systems (see page 54 of *IEEE Computer*, January, 1990).

The workshop will cover experiences, performance, and observations obtained from current efforts in distributed systems around the world in academia and industry. A similar workshop was held in October 1986 and resulted in a special issue of IEEE Transaction on Software Engineering (June 1989).

Please submit 10 copies of a 2 page extended abstract to

Professor Bharat Bhargava
Department of Computer Science
Purdue University
West Lafayette, IN 47906 USA

(317) 494-6013
bb@cs.purdue.edu

by **April 10, 1990**. This abstract will be used to invite speakers and participants to this limited attendance workshop. The program committee for the workshop is as follows: Calton Pu (Columbia), Ken Birman (Cornell), Satish Tripathi (Maryland), George Leach (AT&T, Paradyne), Gene Spafford (Purdue), John Riedl (Minnesota), Prasun Dewan (Purdue), Kane Kim (UC-Irvine), Terje Fallmyr (Univ. of Tromso, Norway), Roger Shultz (Rockwell Intl.), Yousef Khalidi (Sun Microsystems), and Hugh Lauer (Kodak).

Papers based on the submission and workshop will be considered for publication in the newsletter of the Technical Committee on Distributed Processing, Proceedings of the workshop, and a special issue of a journal.

Call for Papers:
Large Installation Systems Administration Conference
Colorado Springs, CO, October 17-19, 1990

The Fourth USENIX Large Installation Systems Administration Conference will be held in Colorado Springs, Colorado on October 18-19, 1990. A tutorial program will be offered in conjunction with the conference on October 17.

The program committee will be reviewing papers submitted on subjects including but not limited to:

Automation of tasks
Network management
Distributed services
System backup
File and data archiving
Electronic mail
Security
Account/user management
Accounting
USENET News/Notes
Performance monitoring and tuning
Configuration management
Vendor issues
Distributed administration

We are especially interested in papers which provide freely available or fully described solutions to existing problems, or which in some way advance the state of the art. Administration of installations which are "unique" in any fashion (size, hardware, number of users, security level, etc.) is also of special interest.

Papers should be from 5 to 15 pages in length, including diagrams, figures, etc. Papers should include a brief description of the site, an outline of the problem and issues, and a description of the solution. We prefer, but do not require electronic form, e.g., *nroff/troff*, TeX, Postscript, etc.

Workshop proceedings will be distributed to all the attendees and are also available after the Conference from the USENIX Association.

The deadline for submission of papers is **July 25, 1990**.

For further information about the conference, contact the program chair:

Steve Simmons
Industrial Technology Institute
2901 Hubbard Road
Ann Arbor, MI 48109

313-769-4086
scs@iti.org

Call for Papers: EUUG Conference

October 22-26, 1990, Nice, France

The Autumn 1990 European UNIX systems User Group Technical Conference will be held October 22-26, 1990, at the Nice Acropolis, Nice, France. Technical tutorials on UNIX and closely related subjects will be held on October 22-23, followed by the three day conference with a commercial exhibition.

Call for Papers

The EUUG invites papers from those wishing to present their work. Full papers or extended abstracts must be submitted. All submitted papers will be refereed and judged with respect to their quality, originality, and relevance.

Suggested subject areas include, but are not limited to:

- Software management for large projects
  - Configuration management
  - Maintenance management
  - Update and release control
- OSI and OSI application on a UNIX platform
- System administration in a heterogeneous environment
- Security and audit
  - Secure UNIX
  - Securing existing systems
- UNIX in non-English speaking environments
- User Interface management systems

Submissions from students are particularly encouraged under the EUUG Student Encouragement Scheme, details of which are available from the EUUG Secretariat.

Important Dates

Abstract deadline	April 30, 1990
Acceptance notification	May 10, 1990
Final paper received	June 30, 1990
Student Grant Applications deadline	Sept. 1, 1990

Method of Submission

Full papers or extended abstracts **must** be submitted by post to the EUUG Secretariat and, if possible, in electronic form to *euug-nice@eu.net*. All submissions will be acknowledged by return of post.

Guidance to Authors

A copy of the EUUG guidance to Authors will be sent automatically to everybody that submits a paper. It will also be printed in the Spring edition of the EUUG newsletter.

Tutorial Solicitation

Tutorials are an important part of the EUUG's biannual events providing detailed coverage of a number of topics. Past tutorials have been taught by leading experts.

We are keen to provide classes to all levels. Those interested in offering a tutorial should contact the EUUG Tutorial Executive as soon as possible.

Additional Information

We will be pleased to provide advice to potential speakers, and can be contacted at the addresses below.

If you wish receive further information about this and future EUUG events, please write, or send electronic mail, to the Secretariat.

EUUG Secretariat
Owles Hall
Owles Lane
Buntingford, Herts SG9 9PL UK

Phone: (+44) 763 73039
Fax: (+44) 763 73255
Email: euug@eu.net

Conference & Tutorial Executive
Neil Todd
GiD Ltd
Email: neil@gid.co.uk

Program Chair
Johan Helsingius
OY Penetron Ab
Email: julf@fuug.fi

Program Committee

Pierre Louise Neumann	INRIA France
Dr. Elod Knuth	MTA SZTAKI, Hungary
Daniel Klein	CMU, USA

Long-Term Calendar of UNIX Events†

1990 Apr 9	POSIX APP Workshop	NIST; Gaithersburg, MD
1990 Apr 9-11	USENIX C++ Conference	San Francisco, CA
1990 Apr 23-27	EUUG	Munich, Germany
1990 Apr 23-27	IEEE 1003	Salt Lake City, UT
1990 May 7-11	DECUS	New Orleans, LA
1990 May 17	U & Parallel Systems, NLUUG	Ede, Netherlands
1990 May 30-Jun 1	UNIX/90	/usr/group/cdn; Toronto, Ont.
1990 Jun 11-15	USENIX	Marriott Hotel, Anaheim, CA
1990 Jun 11-15	ISO WG15 (POSIX)	Paris, France
1990 Jul 9-11	15th JUS Symposium	Tokyo, Japan
1990 Jul 11-13	UKUUG	London, UK
1990 Jul 16-20	IEEE 1003	Danvers, MA
1990 Jul 17-19	UniForum	Washington, DC
1990 Aug 20-23	Interex	Boston, MA
1990 Aug 27-28	*Security	Portland, OR
1990 Sep 4-5	GUUG	Wiesbaden, Germany
1990 Sep 25-28	AUUG	World Congress Centre, Melbourne, Aust.
1990 Oct 4-5	*Mach	Burlington, VT
1990 Oct 17-19	*Large Installation Sys. Admin.	Colorado Springs, CO
1990 Oct 8-12	InterOp 90 ACE	San Jose, CA
1990 Oct 15-19	IEEE 1003	Seattle, WA
1990 Oct 22-26	EUUG	Nice, France
1990 Oct 31-Nov 1	UNIX Expo	New York, NY
1990 Nov 5-9	Computer Communication Conf.	ICCC; New Delhi, India
1990 Nov 8	Open Systems, NLUUG	Ede, Netherlands
1990 Nov 14-16	UNIX EXPO '90 UniForum	Stockholm, Sweden
1990 Nov 15	POSIX APP Workshop	NIST; Gaithersburg, MD
1990 Nov 15-16	16th JUS Symposium	Osaka, Japan
1990 Dec 4-5	JUS UNIX Fair '90	Tokyo, Japan
1990 Dec 10-12	UNIX Asia '90	Sinix, Singapore
1990 Dec 10-14	DECUS	Las Vegas, NV
1991 Jan 7-11	IEEE 1003	New Orleans, LA
1991 Jan 16-18	*Software Devel. Environments	Grand Kempinski, Dallas, TX
1991 Jan 21-25	USENIX	Grand Kempinski, Dallas, TX
1991 Jan 22-25	UniForum	Infomart, Dallas, TX
1991 Feb	UNIX in Government	Ottawa, Ont.
1991 Feb 18-22	DECUS	Ottawa, Ont.
1991 May	UNIX 8x/etc	/usr/group/cdn; Toronto, Ont.
1991 May 6-10	DECUS	Atlanta, GA
1991 May 20-24	EUUG	Tromso, Norway
1991 Jun 10-14	USENIX	Opryland, Nashville, TN
1991 Jun/Jul	UKUUG	Liverpool, UK
1991 Sep 16-20	EUUG	Budapest, Hungary
1991 Dec	UKUUG	Edinburgh, UK
1991 Dec 9-13	DECUS	Anaheim, CA
1992 Jan 20-24	USENIX	Hilton Square, San Francisco, CA
1992 Jan 21-24	UniForum	Moscone Center, San Francisco, CA
1992 Spring	EUUG	Jersey, UK
1992 May 4-8	DECUS	Atlanta, GA
1992 Jun 8-12	USENIX	Marriott, San Antonio, TX
1992 Autumn	EUUG	Amsterdam, Netherlands

† Compiled with the assistance of Alain Williams of the EUUG, Susanne Smith of Windsound Consulting and John Quarterman of Texas Internet Consulting.

* USENIX Workshops

Book Review

The Design and Implementation of the 4.3BSD UNIX Operating System

Leffler, McKusick, Karels, & Quarterman

(Addison-Wesley, 1989)

Reviewed by Sunil K. Das

City University London Computer Science Department

This learned volume presents knowledge about the Berkeley variant of the UNIX operating system previously unavailable in one text. The four authors are known within the UNIX community for their expert computing skills, articulate conference presentations, and the quality of their written technical papers. It is therefore, difficult to imagine the book being anything other than very good.

John Lions in Australia documented the internals of 6th Edition UNIX as long ago as 1977, but the 4.3BSD book will ultimately be considered alongside Maury Bach's account of System V.2 internals,[1] which is possibly unwise since their target audiences are different. By some quirk of fate both books are 471 pages long, with the V.2 account being aimed at introducing readers to operating systems at a first level, while the 4.3BSD text provides a natural progression and addresses a more knowledgeable, second level, advanced scholar.

The layout of this book provides a sensible way to document a process-based operating system. It commences with an excellent four page Preface giving a concise account of the material covered, its applicability to academic courses and the overall organization. It is structured into five parts and further subdivided into chapters:

1. Overview – History and Goals, Design Overview of 4.3BSD, Kernel Services

2. Processes – Process Management, Memory Management

3. I/O System – I/O System Overview, The File System, Device Drivers, Terminal Handling

4. Interprocess Communication – Interprocess Communication, Network Communication, Network Protocols

5. System Operation – System Startup

Graded exercises appear at the end of each chapter which range from testing the reader's knowledge of what has appeared in the text to presenting major design projects or open research questions. References for the chapter follow the exercises and there is an extensive Glossary and Index at the end of the book.

The book is enjoyable to read, with a very direct style. Periodically, the style does drift a little, which is not surprising with four authors, but this does not detract from its readability. There are lengthy descriptions of algorithms, and text with only a few sentences being difficult to understand. My suspicion is that these instances occur because the book is written by Americans for a US market or maybe I simply didn't understand the few sentences.

A useful perspective is gained from the discussion about the internals of early versions of UNIX. Since UNIX has evolved with the hardware, it is possible to see why some redundant code exists in UNIX, namely, for historical reasons and/or backwards compatibility. Moreover, as well as concentrating on an implementation description, the text discusses and details the reasoning behind the design of 4.3BSD. It not only gives an in-depth description of how things work, but more importantly, we are told why things are there.

My perception was that the 4.3BSD book, compared with the V.2 text, had fewer diagrams, fewer algorithms and concentrated on the written word. However, the information has been collected together into a coherent structure. In particular, having the details of the "fast file system" in one place, especially the part on file system data

[1] M. J. Bach, *The Design of the UNIX Operating System*, Prentice-Hall, Englewood Cliffs, NJ (1986).

fragmentation, is very helpful. I now understand something that gave me difficulty before. Conversely, 4.3BSD does not have a distributed file system and I believe an omission is that there is no discussion on Sun NFS which is so widely accepted. I appreciate that Sun NFS is not part of 4.3BSD, but it is difficult to separate them nowadays.

Networking (Part 4) is the least understood aspect of BSD UNIX, so a description of the ideas behind mapping protocols into the kernel would have proved useful. In fact, the way this part of the book is written gives the impression that networking evolved into the kernel. We all know that networking was "hacked" into the socket mechanism and not designed into the kernel. Furthermore, the Interprocess Communication chapter "dives in" at a very low level of detail rather than discussing the principles of networking. I found that what has been written did not relate to the kernel. This part of the text has not evolved into the book like other subjects, where principles and implementations have been discussed in parallel.

The account centers upon the VAX hardware so I was dubious about the usefulness of the memory management section. VAX memory management is quite dated which necessarily affects the discussion. The text will be read by kernel gurus and system programmers, among others, whose typical usage might be to read parts of the book followed by reading some source code. This is fine if you have "vanilla" 4.3BSD and a VAX, but the book won't cope so well for those with different hardware. However, you can't "please all of the people all of the time."

In summary, the text is comprehensive with one or two omissions – no Sun NFS discussion and no discussion on further memory management techniques expected to be found on different versions of BSD4.3. It is the memory management unit rather than the VAX that we need to know about. However, the book is invaluable to anyone working with operating systems. It enables him or her to see the design philosophies behind the construction of a real operating system. One can understand from reading this book how a real operating system works and how to "color" the operating system to suit the hardware.

USENIX Seeks an Editor

The USENIX Board of Directors, at its January meeting (see page 29), decided to begin publishing books, as a natural extension of the Association's already considerable publishing program (conference and workshop proceedings, manuals, *;login:*, and *Computing Systems*).

To that end the Association is seeking candidates to fill the position of Book Editor. The editor will have the support of an editorial board and a managing editor, and will establish, together with the publications committee of the USENIX Board of Directors, an editorial policy and a review process much as was done for the Journal. (The position of Editor will be remunerated.)

All parties interested in the position of Editor should send their resumes and a 500 word statement to the Executive Director as soon as possible, for circulation to the editor search committee. Deadline for submission of application is April 30, 1990.

Electronic Communications Privacy Act

Dan Appelman
Heller, Ehrman, White and McAuliffe

The last question asked at the panel on Ethics in the Computer Industry at the USENIX conference in Washington D.C. in January had to do with the relevance of the Electronic Communications Privacy Act to the discussion of ethical standards. The question did not get an adequate response. Dan Appelman, one of the panelists and legal counsel for the USENIX Association, briefly describes that Act below. If, as a result of this description, there is a response from the readers for a more detailed explanation of the Act, Dan has agreed to supply one in a future issue of *;login:*.

The Electronic Communications Privacy Act of 1986, signed into law on October 26th of that year, is an important piece of legislation for those in the computer industry. It was one of the first attempts of the Federal government to regulate acts interfering with electronic messaging. It is comprehensive and complex and impossible to summarize well in a few short paragraphs. Nevertheless, here are some of its features:

- The Act makes it illegal to intercept, review or disclose the contents of, log initiation and termination information about, or otherwise use certain kinds of electronic communications absent the consent of the sender or the recipient.

- The Act makes it illegal to gain unauthorized access to electronic communication services and to exceed an existing authorization to access such services.

- The Act places restrictions on communication service providers and gives them certain obligations to ensure the privacy of communications between senders and recipients.

- The Act creates both civil and criminal causes of action for violations. On the civil side, those injured may sue in Federal court. Remedies include injunctions, money damages, punitive damages, attorneys fees and costs of suit. The Act also enables the U.S. Justice Department to bring criminal actions against violators. Penalties range from six months to five years in jail and fines up to $250,000 depending on the nature of the violation.

Most of the cases citing the Act have looked at whether the government exceeded its authority in intercepting communications by wire tap. A few others involved private suits against communications service providers for providing services in such a way that message content was available indiscriminately to third parties. In each of these, the court decided that the allegations of illegal conduct were beyond the scope of the Act, and the service provider was found to have operated within the law. The case law interpreting the Act does not yet include instances where hackers have been sued or indicted for illegally intercepting electronic communications.

The Act itself does address some of the activities which were mentioned during the panel discussion on Ethics in the Computer Industry in Washington D.C. However, as I said then, there is an important distinction between legal and ethical constraints. The law, this law included, describes certain minimum standards of behavior which society will tolerate and imposes sanctions for their violation. Ethical standards are imposed, usually self-imposed, on groups which are professional subsets of society. These professions use altogether different standards in describing acceptable behavior than do lawmakers, and there is often no penalty for their violation. The Electronic Communications Privacy Act of 1986 tells us what is illegal behavior, but it does not help us to define what is ethical behavior. The question posed by the panel remains, of course, open.

Best Student Paper

The Program Committee for the Washington, D.C. Technical Conference has named "Disk Scheduling Revisited" by Margo Seltzer, Peter Chen, and John Ousterhout of University of California, Berkeley, the best student paper presented at that conference. An award of $500 was presented to the student authors, Margo Seltzer and Peter Chen.

USENIX Scholarship

In order to further the study of portable operating systems, the USENIX Association will again award a graduate scholarship for the 1990-91 academic year.

The award is for $5000, with no strings attached.

Applicants should be currently enrolled in a graduate program at an accredited post-secondary institution involved in computer research.

Applicants should send a one page summary of their research, along with their most recent transcript (forwarded directly by the official Registrar of the enrolling institution), and three letters of recommendation, one of which should be from the professor directing the student's work. Applications should be sent to:

Ellie Young
Executive Director
USENIX Association
2560 Ninth St., Suite 215
Berkeley, CA 94710

Last date for applications is **April 30, 1990**. The award will be announced at the USENIX Summer Conference.

PLEASE BRING THIS TO THE ATTENTION OF POTENTIALLY INTERESTED STUDENTS. Prior scholarship holders have been from Columbia, U. of Washington, and MIT; the current awardee is James Griffioen at Purdue University.

Work-in-Progress Report: Washington, D.C.

There was only one work-in-progress presentation at the Winter 1990 USENIX Conference. For those of you who were not present, here's the abstract.

CCL – An Interactive Shell Based Upon the C Language

Mark Roschke, Los Alamos National Laboratory

Current UNIX shells utilize little C syntax beyond C expressions. CCL is a general purpose shell written to take advantage of many of the familiar aspects of the C language while maintaining a high degree of interactivity. A wide range of features of the C programming paradigm are provided, including programs, functions, control flow statements, and expressions. This allows the user to draw upon experience with the C language, thereby allowing the user to focus on the aspects of the shell not found in C, such as process control and interactivity.

New Association President

Alan G. Nemeth

At the USENIX Board of Directors meeting in January, I resigned from the Presidency of the Association. A number of questions have since been raised about my resignation, and I would like to clarify what I did and why.

I have been President of the Association since June, 1984, and a director of the Association since June, 1982. This has been a period of extensive growth in the marketplace for the UNIX operating system (dare I say – the open systems market). I took the role of President with a desire to transition the Association from a forum for discussion of technical issues by a small number of dedicated technologists to a professional society with a more rigorous approach to evaluating and presenting the continuing technical work of its members. It was clear in 1984 that the number of individuals who would be participating was going to grow – the question was how to channel that growth into higher quality without losing the informal communication and debate that has been a hallmark of the UNIX community from the beginning.

Overall, I am highly satisfied with the way the Association has developed. I needed and received the assistance of a large number of talented people who have been generous with their time and their opinions. Without the energy and wisdom they provided, the Association would be a much less interesting organization, and could easily have lost the sense of community – the training and helping of others that is a distinguishing characteristic.

It is time for me to retire from the Presidency and give others with their own vision for the next stage of the Association's life a chance to again change the character of the organization. Accordingly, I decided not to run in the upcoming election. You are fortunate to have two excellent candidates for the office of the Presidency in Kirk McKusick and Steve Johnson – it is up to you as a group to decide whose version of the Association is more to your liking. You also have the good fortune to have an excellent slate of candidates for the other Board seats – listen carefully to their different views as you file your ballots.

During the entire term of my Presidency, one of the most valuable members of the Board was the Vice President, Ms. Deborah Scherrer. Debbie has been on the Board of the Association since June, 1980, and Vice President since June, 1984. She has shouldered more than her share of the tasks of running the Association. Debbie has given extensively of her time, her wisdom, and her joy to make the Association a special organization. Without her assistance, my role would have been much more difficult. Debbie has also decided that she will not be a candidate in the current election to allow others their own opportunity to drive the Association.

Once it was clear that neither Debbie nor I would be continuing on the Board past June, I felt that I would like to take the opportunity to honor Debbie's contribution in a way that only I could do. By resigning the Presidency, Debbie automatically became President by the terms of our bylaws for the remainder of her term on the Board. I saw no conflict with the current election since Debbie and I had both declared our intentions clearly. In January, I announced my decision – first privately to Debbie, then to the Board of Directors, and publicly at the Open Meeting with the Board. I retain my role as a director of the Association until the new Board takes office following the June conference.

I would like to ask you all to assist in thanking Debbie for the excellent work she has done for so long.

Summary of Board of Directors' Meeting
Washington, D.C, January 21 and 22, 1990

Attendance: Stephen C. Johnson, Rob Kolstad, Marshall Kirk McKusick, Sharon Murrel, Michael D. O'Dell, Alan G. Nemeth, John S. Quarterman, Deborah K. Scherrer, Ellie Young, Judith DesHarnais, John L. Donnelly, Daniel Klein, John Mashey, Carolyn Carr, Eric Allman, Alain Hénon, Smoot Carl-Mitchell, Kurt Baumann, Shane McCarron, Dominic Dunlop, Peter Collinson, Alix Vasilatos, Evi Nemeth, Rick Adams, Ed Gould, Sonya Neufer, Barry Shein, Dave Taylor, Philip Peake, Neil Todd, Greg Rose.

Nemeth welcomed the board nominees who were attending the meeting.

Action Items

DesHarnais reported that she had received 31 requests for information on daycare services at the D.C. conference. Donnelly said that the posting on the net for participation in the Speakers Bureau had generated 21 responses so far.

D.C. '90 Conference

Klein felt that one of the reasons for better papers at this conference may have been the extended abstracts requirement, which made it easier to select. It was reported that 80% of the 16 tutorials being offered were full, expected total attendance was 1500, and seven talks had been scheduled for the new concurrent sessions.

Anaheim '90 Conference

John Mashey reported that the Call for Papers included more directions for submissions, which he hoped would enable the committee to have better, but possibly fewer abstracts. He is looking for a higher percentage of reflective papers as an experiment.

Professional Development Seminars

Donnelly said that local user group participation is probably essential, and for the upcoming one in Houston, the HOUNIX group is involved. We would evaluate how this one goes at the Spring board meeting before deciding on whether to budget for more seminars this fiscal year.

Graphics V Workshop

Young reported that there were 64 paid attendees. Johnson commented that there were two really outstanding papers, and perhaps the workshop was misnamed.

Future Workshops

Young had requested proposals to chair the next Large Installation Systems Admin. workshop. It was agreed we would be a cooperative sponsor for an IEEE workshop on experimental distributed systems.

Book Publishing Proposal

The proposal was based upon the notion that USENIX would undertake a series of publications, whereby we would underwrite the risk of publishing books that might not be financially viable to other publishers. There was considerable sentiment in favor of USENIX extending its already considerable publishing program to include books. It was decided to allocate funds to pursue this proposal. A committee was formed to oversee this activity, and the board would consider editorial policy and publisher issues at future meetings.

4.4BSD Manuals Proposal

McKusick went over the proposal from the Computer Systems Research Group of UC Berkeley to produce system documentation for the 4.4BSD release incorporating the POSIX and ANSI C standards, an enhanced standardized manual page format with site specific font choice and several other features, which for the first time would be distributable, in printed or source form, without restriction. He explained that they will release two different tapes: 1) complete 4.4BSD and 2) another subdistribution with everything that requires an AT&T license removed. There ensued a discussion about whether to invest in making materials AT&T-free, and whether our role as manuals distributor is still a service to the community. After more discussion, it was agreed that at this time we would fund Phase I of the proposal which covers copy editing and

clerical support for the project, and consider printing and distribution at a later date.

Nemeth pointed out that each of the proposals has a component of a board member benefitting in some way, and that a possible conflict of interest may be buried in each of them. Young would request legal counsel to give us a written opinion on the question of what kinds of conflict of interest rules we should put into place.

Matrix, Inc. Proposal

Matrix, Inc. asked the USENIX board to fund a prototype of a project that will collect, edit and distribute information about computer networks worldwide similar to that in Quarterman's book, *The Matrix*. After much discussion, it was decided that when balancing the cost of it with the benefit to our membership, the cost was too much for what we get.

UUCP Report

Johnson summarized his findings and possible reasons for why USENIX might want to be involved:

1) services were going downhill rapidly and becoming a source of confusion in the environment.

2) there are overt administrative problems

3) the discussion on the net had to do with protocols and getting it done.

4) how do you package it?

There are a lot of technical and administrative issues as yet to be resolved, e.g., how to distribute it? He had received many suggestions such as lobbying AT&T to do it, that USENIX should buy something and put it into public domain, etc.

There ensued a fountain of suggestions. Johnson then outlined the following:

1) protocols are old

2) broken implementation (e.g., way necessary information is filed and stored)

3) different on every system

4) PC and Mac interfaces

5) administrative interface

6) anonymous ftp

Should we give this back to someone as a request for implementation? Johnson mentioned that there is a package being worked on by UUNET for release in the Fall that might help. Adams said he is working on a protocol compatible program, and would report on his progress at the Fall board meeting. Nemeth said that Adam's offer may not resolve this issue.

Kolstad attempted to make a motion to table the discussion. However, discussion continued regarding possible ways for checking out implementation. Nemeth asked if there is something useful that we could do in the future? Johnson felt that this discussion has led to some ideas but the original thrust of why USENIX should be involved, has gone nowhere. No one else volunteered to work on this project and the discussion was tabled.

Journal Report

O'Dell reported that the next two issues were in progress. One would contain the best papers from the USENIX Distributed & Multiprocessor Systems workshop. The other would have a collection of papers on music. It was agreed to allocate funds for the production of a compact disk in this issue.

Proposal to Offer Discounts to Membership

It was agreed that a non-member rate should be reflected for those who wish to purchase proceedings. Young's proposal to raise the workshop registration fee for non-members to $240 (with a checkoff option to become a member) was approved. It was also agreed that funds be allocated to aid students who wish to attend workshops.

Tutorial Compensation Committee Report

The committee reported it had looked into possible changes in what we pay tutorial speakers. It was felt that while we do not have a problem attracting new tutorial speakers, there is a problem of retaining our long-term presenters, and a compensation scheme tied to longevity was appropriate. It was agreed that the compensation currently set at $2,000 per tutorial be set at $2,000 for the first three tutorials given by a speaker (by speaker and not by topic), and thereafter $3,000 per tutorial would apply. In the case of two speakers, a blended rate would would calculated. This scheme would go into effect with the Anaheim conference.

Board Election

Young reported on the calendar of events, and was asked to post the candidates' statements on the net. Taylor advocated using USENET as a forum for the candidates. Most felt that this was inappropriate and that the candidates be contacted individually via e-mail.

ISO Monitoring Project Proposal

It was agreed that we allocate funds to support this WG15 activity in 1990 with the expectation of matching funds being provided by EUUG.

Standards Liaison Proposal

Quarterman felt the proposal would put the USENIX standards activities on a firm financial footing. Johnson asked if funding standards activities is within the Association's charter? Quarterman stressed that our monitoring standards activities is important so that innovation is not prohibited. (See page 33 of this issue.) It was agreed that while Quarterman has performed volunteer standards liaison work for USENIX in the past, he can no longer handle this task for free in the future. After much discussion about the value of continuing this activity, it was agreed that we increase our current budget for additional support of standards activities and allocation of funds be overseen by a subcommittee of McKusick and Young.

Standards Workshop Proposal

McCarron's proposal for a joint IEEE / USENIX Standards Workshop, with possible participation by EUUG and UniForum was approved. He explained that two major areas would need to be addressed: Programming to Standards and Selecting Standards required for Applications, and that the intended audience would be application developers and software managers.

World UNIX Users Group

Dunlop's interest in forming such a group is that it would enable us to have a more credible representation to ISO. It was decided to empower a committee (Quarterman as chair with Nemeth and Murrel) to investigate the feasibility of creating and/or joining an international body to foster effective technical representation in standards.

Collinson and Kolstad suggested the ways to better convey what is going on at the workshops, and Young would implement them.

Next Board Meeting

It will be held in Berkeley, California on April 5 and 6. The first day would be a long-range planning meeting, followed by a regular meeting on the second. All nominees would be invited.

Bylaw Issue

Nemeth expressed his intention to resign from the presidency of the Association and retain his position as a Director of the Association until the end of the elected term in June, 1990. (See page 28 of this issue.) In accordance with the Association bylaws section 4.1.4 the Vice President automatically becomes the President.

– EY

Writers & Book Reviewers Sought for Our Newsletter

The Association would like to invite interested folks to suggest topics and columns, to submit their papers, and to serve as book reviewers to *;login:*. If you have a paper that you would like published, or a topic that needs to be circulated, please let us know. *;login:* is your newsletter and we can only make it more interesting and viable if we have contributions from you, the members.

If you are willing to volunteer to write a column on "current events," "tips 'n hints," serve as a book reviewer, or want to get a message out to the other USENIX members, the Editor (ellie@usenix.org) would like to hear from you.

– EY

Survey of *Computing Systems*

Peter H. Salus
Managing Editor

There were several comments on *Computing Systems* listed in the 1989 Member Survey published in the last issue of *;login:*. I think it appropriate for me to respond to them.

First of all, though, Mike O'Dell and I would like to thank most of you for your plaudits and enthusiasm. Without your help and encouragement, we'd never have been able to make *Computing Systems* a success.

A volume devoted to a particular topic.

> Issue 3.1 of *Computing Systems* will be devoted to such a single topic – music. This has been in the works for over a year. More such issues will occur in the future, but there's a great deal of coordination which goes into this.

Articles that elaborate on papers from conferences.

> If we take this as "conferences and workshops," then issue 3.2 will be such an issue, containing elaborations of papers from the Distributed and Multiprocessor Systems Workshop held last autumn in Florida. Without an extraordinary effort on the part of Gene Spafford, this could not have come about.

More articles that include graphics/illustrations.

> There's lots of this in the next two issues, but we can only print what's submitted. See my general comment.

More how to/applied articles.

> There are some in the works.

More issues!

> It's really gratifying that folks want more. But one of the requirements for publishing more is having more. My computation for the first two years of the journal is that we have published under 20% of the submissions. This may seem very low, but it is a tribute to the volunteer readers and to the staff: we could print more, but the level of quality would drop.

General comment: As I said in both San Francisco and San Diego at the Conferences, USENIX is a volunteer organization. If you don't write and submit stuff, there will be no conference papers, no workshops, no *;login:*, no *Computing Systems*. And if the quality of what's submitted is low, the quality of the product drops or there are fewer pages printed. If you want a special issue of the journal on, say, X.500, then propose it and get a bunch of your buddies to commit to writing stuff on it. If you want more items containing graphics, generate submissions containing them. Mike O'Dell and I can't create contents. I think that the first 10 issues of *Computing Systems* have been extraordinary. If you want this to continue, it's up to you.

An Update on UNIX and C Standards Activity

Jeffrey S. Haemer
Report Editor, USENIX Standards Watchdog Committee

USENIX Standards Watchdog Committee

The reports that accompany this summary are for the Fall meeting of IEEE 1003 and IEEE 1201, conducted the week of October 16-20, 1989, in Brussels, Belgium. (This isn't really true of the 1003.4 and 1003.8/1 reports, but let's overlook that.)

The reports are done quarterly, for the USENIX Association, by volunteers from the individual standards committees. The volunteers are familiarly known as "snitches" and the reports as "snitch reports." The band of snitches and I make up the working committee of the USENIX Standards Watchdog Committee. The group also has a policy committee: John S. Quarterman (chair), Alan G. Nemeth, and Shane P. McCarron. Our job is to let you know about things going on in the standards arena that might affect your professional life – either now or down the road a ways.

More formally: The basic USENIX policy regarding standards is:

> to attempt to prevent standards from prohibiting innovation.

To do that, we

- Collect and publish contextual and technical information such as the snitch reports that otherwise would be lost in committee minutes or rationale appendices or would not be written down at all.
- Encourage appropriate people to get involved in the standards process.
- Hold forums such as Birds of a Feather (BOF) meetings at conferences. We sponsored one workshop on standards.
- Write and present proposals to standards bodies in specific areas.
- Occasionally sponsor White Papers in particularly problematical areas, such as IEEE 1003.7 (in 1989) and possibly IEEE 1201 (in 1990).
- Very occasionally lobby organizations that oversee standards bodies regarding new committees, documents, or balloting procedures.
- Starting in mid-1989, USENIX and EUUG (the European UNIX Users Group) began sponsoring a joint representative to the ISO/IEC JTC1 SC22 WG15 (ISO POSIX) standards committee.

There are some things we do *not* do:

- We do not form standards committees. It's the USENIX Standards Watchdog Committee, not the POSIX Watchdog Committee, not part of POSIX, and not limited to POSIX.
- We do not promote standards.
- We do not endorse standards.

Occasionally we may ask snitches to present proposals or argue positions on behalf of USENIX. They are not required to do so and cannot do so unless asked by the USENIX Standards Watchdog Policy Committee.

Snitches mostly report. We also encourage them to recommend actions for USENIX to take.

John S. Quarterman, Chair
USENIX Standards Watchdog Committee

We don't yet have active snitches for all the committees and sometimes have to beat the bushes for new snitches when old ones retire or can't make a meeting, but the number of groups with active snitches is growing steadily. This quarter, you've seen reports from .1, .4, .5, .6, .8/2, and a belated report of last quarter's .8/1 meeting, as well as a report from 1201. Reports from .2 and .7 are in the pipeline, and may get posted before this summary does. We have no reports from .3, .8/[3-6], .9, .10, or .11, even though we asked Santa for these reports for Christmas.

If you have comments or suggestions, or are interested in snitching for any group, please contact me (*jsh@usenix.org*) or John (*jsq@usenix.org*). If you want to make

suggestions in person, both of us go to the POSIX meetings. The next set will be January 8-12, at the Hotel Intercontinental in New Orleans, Louisiana. Meetings after that will be April 23-27, 1990 in Salt Lake City, Utah, and July 16-20, 1990 in Danvers (Boston), Massachusetts.

I've appended some editorial commentary on problems I see facing each group. I've emphasized non-technical problems, which are unlikely to appear in the official minutes and mailings of the committees. If the comments for a particular group move you to read a snitch report that you wouldn't have read otherwise, they've served their purpose. Be warned, however, that when you read the snitch report, you may discover that the snitch's opinion differs completely from mine.

Report on 1003.0

Outside of dot zero, this group is referred to as "the group that lets marketing participate in POSIX." Meetings seem to be dominated by representatives from upper management of large and influential organizations; there are plenty of tailor-made suits, and few of the jeans and T-shirts that abound in a dot one or dot two meeting. There's a good chance that reading this is making you nervous; that you're thinking, "Uh, oh. I'll bet the meetings have a lot of politics, positioning, and discussion about 'potential direction.'" Correct. This group carries all the baggage, good and bad, that you'd expect by looking at it.

For example, their official job is to produce the "POSIX Guide:" a document to help those seeking a path through the open-systems standards maze. Realistically, if the IEEE had just hired a standards expert who wrote well to produce the guide, it would be done, and both cleaner and shorter than the current draft.

Moreover, because dot zero can see the entire open systems standards activities as a whole, they have a lot of influence in what new areas POSIX addresses. Unfortunately, politics sometimes has a heavy hand. The last two groups whose creation dot zero recommended were 1201 and the internationalization study group. There's widespread sentiment, outside of each group (and, in the case of internationalization, inside of the group), that these groups were created at the wrong time, for the wrong reason, and should be dissolved, but won't be. And sometimes, you can find the group discussing areas about which they appear to have little technical expertise. Meeting before last, dot zero spent an uncomfortable amount of time arguing about graphics primitives.

That's the predictable bad side. The good side? Frankly, these folks provide immense credibility and widespread support for POSIX. If dot zero didn't exist, the only way for some of the most important people and organizations in the POSIX effort to participate would be in a more technical group, where the narrow focus would block the broad overview that these folks need, and which doing the guide provides.

In fact, from here it looks as though it would be beneficial to POSIX to have dot zero actually do more, not less, than it's doing. For example, if dot five is ever going to have much impact in the Ada community, someone's going to have to explain to that community why POSIX is important, and why they should pay more attention to it. That's not a job for the folks you find in dot five meetings (mostly language experts); it's a job for people who wear tailor-made suits; who understand the history, the direction, and the importance of the open systems effort; and who know industry politics. And there are members of dot zero who fit that description to a tee.

Report on 1003.1

Is dot one still doing anything, now that the ugly green book is in print? Absolutely.

First, it's moved into maintenance and bug-fix mode. It's working on a pair of extensions to dot 1 (A and B), on re-formatting the ugly green book to make the ISO happy, and on figuring out how to make the existing standard language-independent. (The developer, he works from sun to sun, but the maintainer's work is never done.) Second, it's advising other groups and helping arbitrate their disputes. An example is the recent flap over transparent file access, in which the group defining the standard (1003.8/1) was told, in no uncertain terms, that NFS wouldn't do, because it wasn't consistent with dot one

semantics. One wonders if things like the dot six *chmod* dispute will finally be resolved here as well.

A key to success will be keeping enough of the original dot one participants available and active to ensure consistency.

Report on 1003.2

Dot one standardized the UNIX section two and three commands. (Okay, okay. All together now: "It's not UNIX, it's POSIX. All resemblance to any real operating system, living or dead, explicit or implied, is purely coincidental.") Dot two is making a standard for UNIX section one commands. Sort of.

The dot two draft currently in ballot, "dot-two classic," is intended to standardize commands that you'd find in shell scripts. Unfortunately, if you look at dot-two classic you'll see things missing. In fact, you could have a strictly conforming system that would be awfully hard to develop software on or port software to. To solve this, NIST pressured dot two into drawing up a standard for a user portability extension (UPE). The distinction is supposed to be that dot-two classic standardizes commands necessary for shell script portability, while the UPE standardizes things that are primarily interactive, but aid user portability.

The two documents have some strategic problems.

- Many folks who developed dot-two classic say the UPE is outside of dot two's charter, and won't participate in the effort. This sort of behavior unquestionably harms the UPE. Since I predict that the outside world will make no distinction between the UPE and the rest of the standard, it will actually harm the entire dot-two effort.

- The classification criteria are unconvincing. *nm(1)* is in the UPE. Is it really primarily used interactively?

- *cc* has been renamed *c89*, and *lint* may become *lint89*. This is silly and annoying, but look on the bright side: at least we can see why *c89* wasn't put in the UPE. Had it been, it would have had to have a name users expected.

- Who died and left NIST in charge? POSIX seems constantly to be doing things that it didn't really want to do because it was afraid that if it didn't, NIST would strike out on its own. Others instances are the accelerated timetables of .1 and .2, and the creation of 1003.7 and 1201.)

- Crucial pieces of software are missing from dot two. The largest crevasse is the lack of any form of source-code control. People on the committee don't want to suffer through an SCCS-RCS debate. POSIX dealt with the *cpio-tar* debate. (It decided not to decide.) POSIX dealt with the *vi-emacs* debate. (The UPE provides a standard for *ex/vi*.) POSIX is working on the NFS-RFS debate, and a host of others. Such resolutions are a part of its responsibility and authority. POSIX is even working on the Motif-Open/Look debate (whether it should or not).

At the very least, the standard could require some sort of source code control, with an option specifying which flavor is available. Perhaps we could ask NIST to threaten to provide a specification.

As a final note, because dot two (collective) standardizes user-level commands, it really can provide practical portability across operating systems. Shell scripts written on a dot-two-conforming UNIX system should run just fine on an MS-DOS system under the MKS toolkit.

Report on 1003.3

Dot three is writing test assertions for standards. This means dot three is doing the most boring work in the POSIX arena. Oh, shoot, that just slipped out. But what's amazing is that the committee members don't see it as boring. In fact, Roger Martin, who, as senior representative of the NIST, is surely one of the single most influential people in the POSIX effort, actually chairs this committee. Maybe they know something I don't.

Dot three is balloting dot one assertions and working on dot two. The process is moving at standards-committee speed, but has the advantage of having prior testing art as a touchstone (existing MindCraft, IBM, and NIST test work). The dilemma confronting the

group is what to do about test work for other committees, which are proliferating like lagomorphs. Dot three is clearly outnumbered, and needs some administrative cavalry to come to its rescue. Unless it expands drastically (probably in the form of little subcommittees and a steering committee) or is allowed to delegate some of the responsibility of generating test assertions to the committees generating the standards, it will never finish. ("Whew, okay, dot five's done. Does anyone want to volunteer to be a liaison with dot thirty-seven?")

Report on 1003.4

Dot four is caught in a trap fashioned by evolution. It began as a real-time committee. Somehow, it's metamorphosed into a catch-all, "operating-system extensions" committee. Several problems have sprung from this.

- Some of the early proposed extensions were probably right for real-time, but aren't general enough to be the right approach at the OS level.

- Pieces of the dot-four document probably belong in the the dot one document instead of a separate document. Presumably, ISO will perform this merge down the road. Should the IEEE follow suit?

- Because the dot-four extensions aren't as firmly based in established UNIX practice as the functionality specified in dot one and two, debate over how to do things is more heated, and the likelihood that the eventual, official, standard solution will be an overly complex and messy compromise is far higher. For example, there is a currently active dispute about something as fundamental as how threads and signals should interact.

Unfortunately, all this change has diverted attention from a problem that has to be dealt with soon – how to guarantee consistency between dot four and dot five, the Ada-language-binding group. Tasks semantics are specified by the Ada language definition. In order to get an Ada binding to dot four's standard (which someone will have to do), dot four's threads will have to be consistent with the way dot five uses tasks in their current working document. With dot five's low numbers, the only practical way to ensure this seems to be to have dot four aggressively track the work of dot five.

Report on 1003.5

Dot five is creating an Ada-language binding for POSIX. What's "Ada-language binding" mean? Just that an Ada programmer should be able to get any functionality provided by 1003.1 from within an Ada program. (Right now, they're working on an Ada-language binding for the dot one standard, but eventually, they'll also address other interfaces, including those from dot four, dot six, and dot eight.) They face at least two kinds of technical problems and one social one.

The first technical problem is finding some way to express everything in 1003.1 in Ada. That's not always easy, since the section two and three commands standardized by dot one evolved in a C universe, and the semantics of C are sometimes hard to express in Ada, and vice-versa. Examples are Ada's insistence on strong typing, which makes things like *ioctl()* look pretty odd, and Ada's tasking semantics, which require careful thinking about *fork()*, *exec()*, and *kill()*. Luckily, dot five is populated by people who are Ada-language wizards, and seem to be able to solve these problems. One interesting difference between dot five and dot nine is that the FORTRAN group has chosen to retain the organization of the original dot one document so that their document can simply point into the ugly green book in many cases, whereas dot five chose to re-organize wherever it seemed to help the flow of their document. It will be interesting to see which decision ends up producing the most useful document.

The second technical problem is making the solutions look like Ada. For more discussion of this, see the dot-nine (FORTRAN bindings) summary. Again, this is a problem for Ada wizards, and dot five can handle it.

The social problem? Interest in dot five's work, outside of their committee, is low. Ada is out-of-favor with most UNIX programmers. ("Geez, 1201 is a mess. Their stuff's gonna look as ugly as Ada.") Conversely, most of the Ada community's not interested in UNIX. ("Huh? Another 'standard' operating

environment? How's it compare to, say, PCTE? No, never mind. Just let me know every few years how it's coming along.") The group that has the hardest problem – welding together two, well-developed, standardized, disparate universes – has the least help.

Despite all of this, the standard looks like it's coming close to ballot, which means people ought to start paying attention to it before they have no choice.

Report on 1003.6

Most of the UNIX community would still feel more at home at a Rainbow gathering than reading the DOD rainbow books. The unfamiliar-buzzword frequency at dot six (security) meetings is quite high. If you can get someone patient to explain some of the issues, though, they're pretty interesting. The technical problems they're solving each boil down to thinking through how to graft very foreign ideas onto UNIX without damaging it beyond recognition. (The recent posting about *chmod* and access control lists, in *comp.std.unix* by Ana Maria de Alvare and Mike Ressler, is a wonderful detailed example.)

Dot six's prominent non-technical problem is just as interesting. The government has made it clear that vendors who can supply a "secure UNIX" will make a lot of money. No fools, major vendors have been furiously working on implementations. The push to provide a POSIX security standard comes at a time when these vendors are already quite far along in their efforts, but still some way from releasing the products. Dot six attendees from such corporations can't say too much, because it will give away what they're doing (remember, too, that this is security), but must somehow ensure that the standard that emerges is compatible with their company's existing, secret implementation.

Report on 1003.7

There is no single standard body of practice for UNIX system administration, the area dot seven is standardizing. Rather than seek a compromise, dot seven has decided to reinvent system administration from scratch. This was probably necessary simply because there isn't enough existing practice to compromise on. Currently, their intent is to provide an object-oriented standard, with objects specified in ASN.1 and administration of a multi-machine networked system as a target. (This, incidentally, was the recommendation of a USENIX White Paper on system administration by Susanne Smith and John Quarterman.) The committee doesn't have a high proportion of full-time system administrators, or a large body of experience in object-oriented programming. It's essentially doing research by committee. Despite this, general sentiment outside the committee seems to be that it has chosen a reasonable approach, but that progress may be slow.

A big danger is that they'll end up with a fatally flawed solution: lacking good available implementations; distinct enough from existing practices, where they exist, to hamper adoption; and with no clear-cut advantage to be gained by replacing any ad hoc existing solutions except for standard adherence. The standard could be widely ignored.

What might prevent that from happening? Lots of implementations. Object-oriented programming and C++ are fashionable (at the 1988, Winter Usenix C++ conference, Andrew Koenig referred to C++ as a "strongly hyped language"); networked UNIX systems are ubiquitous in the research community; and system administration has the feeling of a user-level solvable problem. If dot seven (perhaps with the help of dot zero) can publicize their work in the object-oriented programming community, we can expect OOPSLA conferences and *comp.sources.unix* to overflow with high-quality, practical, field-tested, object-oriented system administration packages that conform to dot seven.

Report on 1003.8

There are two administrative problems facing dot eight, the network services group. Both stem directly from the nature of the subject. There is not yet agreement on how to solve either one.

The first is its continued growth. There is now serious talk of making each subgroup a full-fledged POSIX committee. Since there are

currently six groups (transparent file access, network IPC, remote procedure call, OSI/MAP services, X.400 mail gateway, and directory services), this would increase the number of POSIX committees by nearly 50%, and make networking the single largest aspect of the standards work. This, of course, is because standards are beneficial in operating systems, and single-machine applications, but indispensable in networking.

The second is intergroup coordination. Each of the subgroups is specialized enough that most dot eight members only know what's going on in their own subgroup. But because the issues are networking issues, it's important that someone knows enough about what each group is doing to prevent duplication of effort or glaring omissions. And that's only a piece of the problem. Topics like system administration and security are hard enough on a single stand-alone machine. In a networked world, they're even harder. Someone needs to be doing the system engineering required to ensure that all these areas of overlap are addressed, addressed exactly once, and completed in time frames that don't leave any group hanging, awaiting another group's work.

The SEC will have to sort out how to solve these problems. In the meantime, it would certainly help if we had snitches for each subgroup in dot eight. Any volunteers for .8/[3-6]?

Report on 1003.9

Dot nine, which is providing FORTRAN bindings, is really fun to watch. They're fairly unstructured, and consequently get things done at an incredible clip. They're also friendly; when someone new arrives, they actually stop, smile, and provide introductions all around. It helps that there are only half-a-dozen attendees or so, as opposed to the half-a-hundred you might see in some of the other groups. Meetings have sort of a "we're all in this together / defenders of the Alamo" atmosphere.

The group was formed after two separate companies independently implemented FORTRAN bindings for dot one and presented them to the UniForum technical committee on supercomputing. None of this, "Let's consider forming a study group to generate a PAR to form a committee to think about how we might do it," stuff. This was rapid prototyping at the standards level.

Except for the advantage of being able to build on prior art (the two implementations), dot nine has the same basic problems that dot five has. What did the prior art get them? The most interesting thing is that a correct FORTRAN binding isn't the same as a good FORTRAN binding. Both groups began by creating a binding that paralleled the original dot one standard fairly closely. Complaints about the occasional non-FORTRANness of the result have motivated the group to try to redesign the bindings to seem "normal" to typical FORTRAN programmers. As a simple example, FORTRAN-77 would certainly allow the declaration of a variable in common called ERRNO, to hold the error return code. Users, however, would find such name misleading; integer variables, by default and by convention, begin with "I" through "N."

It is worth noting that dot nine is actually providing FORTRAN-77 bindings, and simply ignoring FORTRAN-8x. (Who was it that said of 8x, "Looks like a nice language. Too bad it's not FORTRAN"?) Currently, 1003 intends to move to a language-independent specification by the time 8x is done, which, it is claimed, will ease the task of creating 8x bindings.

On the surface, it seems logical and appealing that documents like 1003.1 be rewritten as a language-independent standard, with a separate C-language binding, analogous to those of dot five and dot nine. But is it really?

First, it fosters the illusion that POSIX is divorced from, and unconstrained by its primary implementation language. Should the prohibition against null characters in filenames be a base-standard restriction or a C-binding restriction?

I've seen a dot five committee member argue that it's the former. Looked at in isolation, this is almost sensible. If Ada becomes the only language anyone wants to run, yet the government still mandates POSIX compliance, why should a POSIX implementation prohibit its filenames from containing characters that aren't special to Ada? At the same time, every

POSIX attendee outside of dot five seems repelled by the idea of filenames that contain nulls. (Quiz: Can you specify a C-language program or shell script that will create a filename containing a null?)

Second, C provides an existing, precise, widely-known language in which POSIX can be specified. If peculiarities of C make implementing some portions of a standard, specified in C, difficult in another language, then there are four clear solutions:

1. change the specification so that it's equally easy in C and in other languages,

2. change the specification so that it's difficult in every language,

3. change the specification so that it's easy in some other language but difficult in C, or

4. make the specification vague enough so that it can be done in incompatible (though equally easy) ways in each language.

Only the first option makes sense. Making the specification language-independent means either using an imprecise language, which risks four, or picking some little-known specification language (like VDL), which risks two and three. Declaring C the specification language does limit the useful lifetime of POSIX to the useful lifetime of C, but if we don't think we'll come up with good replacements for both in a few decades, we're facing worse problems than language-dependent specifications.

Last, if you think the standards process is slow now, wait until the IEEE tries to find committee volunteers who are fluent in both UNIX and some language-independent specification language. Not only will the useful lifetime of POSIX remain wedded to the useful lifetime of C, but both will expire before the language-independent version of dot one is complete.

It would be nice if this push for language-independent POSIX would go away quietly, but it won't.

Report on 1003.10

In July, at the San Jose meeting, John Caywood of Unisys caught me in the halls and said, accusingly, "I understand you think supercomputers don't need a batch facility." I didn't have the foggiest idea what he was talking about, but it seemed like as good a chance as any to get a tutorial on dot ten, the supercomputing group, so I grabbed it. (Pretty aggressively helpful folks in this supercomputing group. If only someone in it could be persuaded to file a snitch report.)

Here's the story:

Articles about software engineering like to point out that approaches and tools have changed from those used twenty years ago; computers and computing resources are now much cheaper than programmers and their time, while twenty years ago the reverse was true. These articles are written by people who've never used a Cray. A typical supercomputer application might run on a $25M, non-byte-addressable, non-virtual-memory machine, require 100 to 1000 Mbytes of memory, and run for 10 Ksecs. Expected running time for jobs can be greater than the machine's mean-time-to-failure. The same techniques that were common twenty years ago are still important on these machines, for the same reasons – we're working close to the limits of hardware art.

The card punches are gone, but users often still can't login to the machines directly, and must submit jobs through workstation or mainframe front ends. Resources are severely limited, and access to those resources need to be carefully controlled. The two needs that surface most often are checkpointing and a batch facility.

Checkpointing lets you re-start a job in the middle. If you've used five hours of Cray time, and need to continue your run for another hour but have temporarily run out of grant money, you don't want to start again from scratch when the money appears. If you've used six months of real time running a virus-cracking program and the machine goes down, you might be willing to lose a few hours, even days, of work, but can't afford to lose everything. Checkpointing is a hard problem, without a generally agreed-upon solution.

A batch facility is easier to provide. Both Convex and Cray currently support NQS, a public domain network queueing system. The product has enough known problems that the

group is re-working the facility, but the basic model is well-understood, and the committee members, both users and vendors, seem to want to adopt it. The goal is command-level and library-level support for batch queues that will provide effective resource management for really big jobs. Users will be able to do things like submit a job to a large machine through a wide-area network, specify the resources – memory, disk space, time, tape drives, etc. – that the job will need to run to completion, and then check back a week or two later to find out how far their job's progressed in the queue.

The group is determined to make rapid progress, and to that end is holding 6-7 meetings a year. One other thing: the group is actually doing an application profile, not a standards document. For an clarification of the distinction, see the discussion of dot eleven.

Report on 1003.11

Dot eleven has begun work on an application profile (AP) on transaction processing (TP). An AP is a set of pointers into the POSIX Open System Environment (OSE). For example, the TP AP might say, "For dot eleven conformance, you need to conform to dot one, dot four, sections 2.3.7 and 2.3.8 of dot 6, 1003.8 except for /2, and provide a batch facility as specified in the dot 10 AP." A group doing an AP will also look for holes or vague areas in the existing standards, as they relate to the application area, go point them out to the appropriate committee, and possibly chip in to help the committee solve them. If they find a gap that really doesn't fall into anyone else's area, they can write a PAR, requesting that the SEC (1003's oversight committee) charter them to write a standard to cover it.

Dot eleven is still in the crucial early stage of trying to figure out what it wants to do. Because of fundamental differences in philosophy of the members, the group seems to be thrashing a lot. There is a clear division between folks who want to pick a specific model of TP and write an AP to cover it, and folks who think a model is a far too detailed place to start. The latter group is small, but not easily dismissed.

It will be interesting to see how dot eleven breaks this log jam, and what the resolution is. As an aside, many of the modelers are from the X/OPEN and ISO TP groups, which are already pushing specific models of their own; this suggests what kinds of models we're likely to get if the modeling majority wins.

Report on X3J11

A single individual, Russell Hansberry, is blocking the official approval of the ANSI standard for C on procedural grounds. At some point, someone failed to comply with the letter of IEEE rules for ballot resolution. and Hansberry is using the irregularity to delay adoption of the standard.

This has had an odd effect in the 1003 committees. No one wants to see something like this inflicted on his or her group, so folks are being particularly careful to dot all i's and cross all t's. I say odd because it doesn't look as though Hansberry's objections will have any effect whatsoever on either the standard, or its effectiveness. Whether ANSI puts its stamp on it or not, every C compiler vendor is implementing the standard, and every book (even K&R) is writing to it. X3J11 has replaced one de-facto standard with another even stronger one.

Report on 1201.1

What's that you say, bunky? Uneasy about Xwindows? Well then, you won't care much for 1201.1, which is supposed to be "User Interface: Application Programming Interface," but is really "How much will the Motif majority have to compromise with the Open/Look minority before force-feeding us a thick standard full of 'Xm[A-Z]...' functions with long names and longer argument lists?"

Were this group to change its name to "Xwindows application programming interface," you might not hear nearly as much grousing from folks outside the working group. As it is, the most positive comments you hear are, "Well, X is pretty awful, but I guess we're stuck with it," and "What could they do? If POSIX hadn't undertaken it, NIST would have."

If 1201 is to continue to be called "User Interface," these aren't valid arguments for standardizing on X or toolkits derived from it. In what sense are we stuck with X? The number of X applications is still small, and if X and its toolkits aren't right for the job, it will stay small. Graphics hardware will continue to race ahead, someone smart will show us a better way to do graphics, and X will become a backwater. If they are right, some toolkit will become a de-facto standard, the toolkit will mature, and the IEEE can write a realistic standard based on it.

Moreover, if NIST wants to write a standard based on X, what's wrong with that? If they come up with something that's important in the POSIX world, good for them. ANSI or the IEEE can adopt it, the way ANSI's finally getting around to adopting C. If NIST fails, it's not the IEEE's problem.

If 1201.1 ignores X and NIST, can it do anything? Certainly. The real problem with the occasionally asked question, "are standards bad?" is that it omits the first word: "When." Asked properly, the answer is, "When they're at the wrong level." API's XVT is example of a toolkit that sits above libraries like Motif or the Mac toolbox, and provides programmers with much of the standard functionality necessary to write useful applications on a wide variety of window systems. Even if XVT isn't the answer, it provides proof by example that we can have a window-system-independent, application programming interface for windowing systems. 1201.1 could provide a useful standard at that level. Will it? Watch and see.

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